

Figure 2a
 Novel Compositions with Improved Chitinase Activity
 Muller, et al.
 Serial No. 10/692,367
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	*	20	*	40	*	
ChitinaseA	:	-----CAGAACTGCGGCTGCCAGCCAACTTCTGCTGCAGCAAGTTCGG	:			44
r1B6	:	TCGATG.....	:			50
r1B10	:	TCGATG.....GC.T.GGG.C.G.....CG.....	:			50
r1D4	:	TCGATG.....G...G.A.....T..	:			50
r2A2	:	TCGACG.....GC.T.GGG.C.G.....CG.....	:			50
r2C2	:	TCGATG.....G.A.....T..	:			50
r2E1	:	TCGATG.....GC.T.GGG.C.G.....CG.....	:			50
r2H2	:	TCGATG.....G.A.....	:			50

	60	*	80	*	100	
ChitinaseA	:	CTACTGCGGCACGACCGACGCCTACTGCGGCACGGGTGCCAGTCGGGCC	:			94
r1B6	:	.....AG.....	:			100
r1B10	:	:			100
r1D4	:	.....AG.....	:			100
r2A2	:	:			100
r2C2	:	.....AG.....	:			100
r2E1	:	:			100
r2H2	:	.....AG.....A....	:			100

	*	120	*	140	*	
ChitinaseA	:	CGTGCCGCTCGGGCGGCGGGCGGCGGGCGGGCGGGCGGAGGCGGCGGA	:			144
r1B6	:	.....	:			150
r1B10	:	.....A..A.T.....T..T.-----	:			142
r1D4	:	.....	:			150
r2A2	:	.....A..A.T.....T..T.-----	:			142
r2C2	:	.....T.....	:			150
r2E1	:	.....A..A.T.....T..T.-----	:			142
r2H2	:	.....T.....	:			150

	160	*	180	*	200	
ChitinaseA	:	GGCAGTGGCGGTGCGAACGTGGCTAATGTGGTCACCGACGCGTTCTTCAA	:			194
r1B6	:	.....A.....	:			200
r1B10	:	-----.....GC..C.....G.T.C.....	:			179
r1D4	:GC..C.....G.T.C.....	:			200
r2A2	:	-----.....GC..C.....G.T.C.....	:			179
r2C2	:	:			200
r2E1	:	-----.....GC..C.....G.T.C.....	:			179
r2H2	:G.....GC..C.....G.T.C.....	:			200

Figure 2b
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	*	220	*	240	*	
ChitinaseA	:	CGGCATCAAGAACCAGGCCGGGAGCGGGTGCGAGGGCAAGAACTTCTACA	:	244		
r1B6	:	.....G.....	:	250		
r1B10	:	.....G.....	:	229		
r1D4	:	.....G.....	:	250		
r2A2	:	.....G.....T.....	:	229		
r2C2	:	.....	:	250		
r2E1	:	.....G.....	:	229		
r2H2	:	.....G.....	:	250		

	260	*	280	*	300	
ChitinaseA	:	CCCGGAGCGCGTTCTGAGCGCCGTCAACGCGTACCCGGGCTTCGCCCCAT	:	294		
r1B6	:	.....G.....A.....	:	300		
r1B10	:	.....G.....A.....	:	279		
r1D4	:	.....	:	300		
r2A2	:	.....G.....A.....	:	279		
r2C2	:	.....CGAG...A..GC.....G...	:	300		
r2E1	:	.....G.....A.....	:	279		
r2H2	:	.....G.....A.....	:	300		

	*	320	*	340	*	
ChitinaseA	:	GGCGGGACGGAGGTGGAGGGCAAGCGCGAGATCGCCGCCTTCTTCGCGCA	:	344		
r1B6	:	.....T..C.....C.....	:	350		
r1B10	:	.....T.....	:	329		
r1D4	:	.....	:	350		
r2A2	:	.....T.....	:	329		
r2C2	:	.....CT.C.....C...C.....T.....	:	350		
r2E1	:	.....T.....	:	329		
r2H2	:	.....T.....	:	350		

	360	*	380	*	400	
ChitinaseA	:	CGTCACGCACGAGACCGGACATTTCTGCTACATCAGCGAGATCAACAAG-	:	393		
r1B6	:	..C.....G.....A.....G..GG.C	:	400		
r1B10	:	.....G.....A.....G..GG.C	:	379		
r1D4	:	..C.....G.....	:	399		
r2A2	:	.....G.....A.....G..GG.C	:	379		
r2C2	:	..C.....G.....G.....	:	399		
r2E1	:	.....G.....A.....G..GG.C	:	379		
r2H2	:G.....A.....G..GG.C	:	400		

Figure 2c
 Novel Compositions with Improved Chitinase Activity
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	*	420	*	440	*	
ChitinaseA	:	--AGCAACGCCTACTGCGACGCGAGCAACAGGCAGTGGCCGTGCGCGGCG	:	441		
r1B6	:	CG.....GAA.....CG..A.....C.....CA....	:	450		
r1B10	:	CG.....GAA.....CG..A.....C.....CA....	:	429		
r1D4	:	--.....	:	447		
r2A2	:	CG.....GAA.....CG..A.....C.....CA....	:	429		
r2C2	:	--.....C...C...G.....C...	:	447		
r2E1	:	CG.....GAA.....CG..A.....C.....CA....	:	429		
r2H2	:	CG.....GAA.....CG..A.....C.....CA....	:	450		

	460	*	480	*	500	
ChitinaseA	:	GGGCAGAAGTACTACGGGCGCGGCCCGCTGCAGATCTCGTGGAACCTACAA	:	491		
r1B6	:	...A..GG.....C.....C.....T...	:	500		
r1B10	:	...A..GG.....C.....	:	479		
r1D4	:	.....	:	497		
r2A2	:	...A..GG.....C.....	:	479		
r2C2	:	.....	:	497		
r2E1	:	...A..GG.....C.....	:	479		
r2H2	:	...A..GG.....C.....	:	500		

	*	520	*	540	*	
ChitinaseA	:	CTACGGGCCCCGCCGGGAGGGACATCGGCTTCAACGGGCTCGCCGACCCCA	:	541		
r1B6	:	.....G.....C.....G.....GG.....G	:	550		
r1B10	:	.....G.....C.....G.....GG.....G	:	529		
r1D4	:	.....G..G.....AG.C.....G.....G.G.....G	:	547		
r2A2	:	.....G.....C.....G.....GG.....G	:	529		
r2C2	:	.....G.....C.....G.....GG.....G	:	547		
r2E1	:	.....G.....C.....G.....GG.....G	:	529		
r2H2	:	.....G.....C.....G.....GG.....G	:	550		

	560	*	580	*	600	
ChitinaseA	:	ACAGGGTGGCGCAGGACGCCGTGATCGCGTTCAAGACGGCGCTCTGGTTC	:	591		
r1B6	:	G.....G.....G.G.....G.....	:	600		
r1B10	:	G.....G.....G.G.....G.....	:	579		
r1D4	:	..GC.....GCAG.....C.....CGCT.C.....A.	:	597		
r2A2	:	G.....G.....G.G.....G.....	:	579		
r2C2	:	G.....G.....G.G.....G.....	:	597		
r2E1	:	G.....G.....G.G.....G.....	:	579		
r2H2	:	G.....G.....G.A.....G.....	:	600		

Figure 2d
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	*	620	*	640	*	
ChitinaseA	:	TGGATGAACAACGTGCACCGTGTGATGCCGCAGGGCTTCGGCGCCACCAT	:	641		
r1B6	:	.....G.....G.G.....	:	650		
r1B10	:	.....G...A.....AGC.C.....C.....G.....	:	629		
r1D4	:	.....G.G...G.....G.....C	:	647		
r2A2	:	.....G...A.....AGC.C.....C.....G.....	:	629		
r2C2	:	.....	:	647		
r2E1	:	.....G...A.C.....AGC.C.....C.....G.....	:	629		
r2H2	:	.....G...A.....AGC.C.....C.....G.....	:	650		

	660	*	680	*	700	
ChitinaseA	:	CAGGGCCATCAACGGCGCCCTCGAGTGCAACGGGAACAACCCCGCCCAGA	:	691		
r1B6	:	:	700		
r1B10	:	:	679		
r1D4	:	:	697		
r2A2	:	:	679		
r2C2	:	:	697		
r2E1	:	:	679		
r2H2	:	:	700		

	*	720	*	740	*	
ChitinaseA	:	TGAACGCGCGCTCGGCTACTACAAGCAGTACTGCCAGCAGCTCCGCGTC	:	741		
r1B6	:	.....	:	750		
r1B10	:	.....G.....GC.....G.....	:	729		
r1D4	:	.....G.....GC.....G.....	:	747		
r2A2	:	.....G.....GC.....G.....	:	729		
r2C2	:	.....G.....GC.....G.....	:	747		
r2E1	:	.....G.....GC.....G.....	:	729		
r2H2	:	.....G.....GC.....G.....	:	750		

	760	*	
ChitinaseA	:	GACCCAGGGCCCAACCTCACTTGC	: 765
r1B6	:	: 774
r1B10	:G..CAA.....C...	: 753
r1D4	:C.....C...	: 771
r2A2	:G..CAA.....C...	: 753
r2C2	:G..CAA.....C...	: 771
r2E1	:G..CAA.....C...	: 753
r2H2	:G..CAA.....C...	: 774

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	*	20	*	40	*
ChitinaseA	:	--QNCGCQPNFCCSKFGYCGTTDAYCGDGCQSGPCRSGGGGGGGGGGGGG	:	48	
r1B6	:	SM.....E.....	:	50	
r1B10	:	SM....ASGL...R.....SS....---	:	47	
r1D4	:	SM.....V.....E.....	:	50	
r2A2	:	ST....ASGL...R.....SS....---	:	47	
r2C2	:	SM.....V.....E.....	:	50	
r2E1	:	SM....ASGL...R.....SS....---	:	47	
r2H2	:	SM.....V.....E.....	:	50	

	60	*	80	*	100	
ChitinaseA :	GSGGANVANVVTD	AFFNGIKNQAG	SGCEGKNFYTR	SAFLSAVNAY	PGFAH :	98
r1B6 :	.....	S.....	.....	K.....	:	100
r1B10 :	-----	S...GS.....	S.....	K.....	:	92
r1D4 :	.....	S...GS.....	S.....	.....	:	100
r2A2 :	-----	S...GS.....	S.....	K.....	:	92
r2C2 :	.....	.....	.....	E.IA.....	:	100
r2E1 :	-----	S...GS.....	S.....	K.....	:	92
r2H2 :	.....	S...GS.....	S.....	K.....	:	100

		*	120	*	140	*	
ChitinaseA	:	GGTEVEGKREIAAFFAHVTHETGHFCYISEINK-SNAYCDASNRQWPCAA	:	147			
r1B6	:	..SQ.Q.....A.....N..DGP.KN...RN.T...Q.	:	150			
r1B10	:	..S.....N..DGP.KN...RN.T...Q.	:	142			
r1D4	:	.....A.....--.....	:	148			
r2A2	:	..S.....N..DGP.KN...RN.T...Q.	:	142			
r2C2	:	..S...R.....A.....V.--.....PTK.....	:	148			
r2E1	:	..S.....N..DGP.KN...RN.T...Q.	:	142			
r2H2	:	..S.....N..DGP.KN...RN.T...Q.	:	150			

	160	*	180	*	200	
ChitinaseA	: GQKYYGRGPLQISWNYNYGPAGRDIGFNGGLADPNRVAQDAVIAFKTALWF	:	197			
r1B6	: .KG.....F.....A...D..G..G...R...V...A....	:	200			
r1B10	: .KG.....A...D..G..G...R...V...A....	:	192			
r1D4	:SL..D..G..DA..RS..L..RS...Y	:	198			
r2A2	: .KG.....A...D..G..G...R...V...A....	:	192			
r2C2	:A...D..G..G...R...V...A....	:	198			
r2E1	: .KG.....A...D..G..G...R...V...A....	:	192			
r2H2	: .KG.....A...D..G..G...R...V...A....	:	200			

Figure 3b
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	*	220	*	240	*	
ChitinaseA	:	WMNNVHRVMPQGFGATIRAINGALECNNGNNPAQM	:	NARVGYYKQYCQQLRV	:	247
r1B6	:	...S..G.....	:		:	250
r1B10	:	..K.M.QL.....	:	R...R..G.	:	242
r1D4	:	.....G.V.....T.....	:	R...R..G.	:	248
r2A2	:	..K.M.QL.....	:	R...R..G.	:	242
r2C2	:	.....	:	R...R..G.	:	248
r2E1	:	..K.I.QL.....	:	R...R..G.	:	242
r2H2	:	..K.M.QL.....	:	R...R..G.	:	250

ChitinaseA	:	DPGPNLTC	:	255
r1B6	:	.....	:	258
r1B10	:	...N....	:	250
r1D4	:	.....	:	256
r2A2	:	...N....	:	250
r2C2	:	...N....	:	256
r2E1	:	...N....	:	250
r2H2	:	...N....	:	258

Figure 6a
Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4M1/1_H2	:	TCGATGCAGAACTGCGGCTGCCAGCCAAACGTATGCTGCAGCAAGTTTGGCTACT	:	55		
4M1/11_C10	:	.....G...GC.T.GGG.C.G.....CG...C..G....	:	55		
4M1/26_C2	:	.....G...GC.T.GGG.C.G.....CG...C..G....	:	55		
		60	*	80	*	100
4M1/1_H2	:	GCGGCACGACCGACGAGTACTGCGGCGACGGGTGCCAGTCGGGCCCCGTGCCGCTC	:	110		
4M1/11_C10	:	.....	:	110		
4M1/26_C2	:	....G...GG...G..C.....C.....	:	110		
		120	*	140	*	160
4M1/1_H2	:	GGGCGGCGGCGGCAGCAGTGGCGGCGGCGGAGGCGGCGGAGGCAGTGGCGGTGCG	:	165		
4M1/11_C10	:	.....-----A..A.T.....T-----	:	144		
4M1/26_C2	:	.....-----	:	156		
	*	180	*	200	*	220
4M1/1_H2	:	AACGTGGCTAATGTGGTCACCGACGCGTTCTTCAACGGCATCAAGAACCAGGCCG	:	220		
4M1/11_C10	:	.....GC..C.....G.T.C.....G.....	:	199		
4M1/26_C2	:	.....	:	211		
	*	240	*	260	*	
4M1/1_H2	:	GGAGCTGGTGCGAGGGCAAGAACTTCTACACCCGGAGCGCGTTTCCTGAGCGCCGT	:	275		
4M1/11_C10	:	.....G.....	:	254		
4M1/26_C2	:	.....G.....	:	266		
		280	*	300	*	320
4M1/1_H2	:	CAAGGCGTACCCAGGCTTCGCCCATGGCGGGTCGCAGGTGCAGGGCAAGCGCGAG	:	330		
4M1/11_C10	:	.....	:	309		
4M1/26_C2	:	.....G.....C..CG....CG..C.....	:	321		
		340	*	360	*	380
4M1/1_H2	:	ATCGCCGCCTTCTTCGCGCATGTACGCACGAGACCGGGCATTGTGTGCTACATCA	:	385		
4M1/11_C10	:	.....C.C.....C.....	:	364		
4M1/26_C2	:	..T.....C.....	:	376		
	*	400	*	420	*	440
4M1/1_H2	:	ACGAGGTCAACAAGAGCAACGCCTACTGCGACCCGACCAAGAGGCAGTGGCCGTG	:	440		
4M1/11_C10	:	G....A.....	:	419		
4M1/26_C2	:	G....A.....	:	431		

Figure 6b
Novel Compositions with Improved Chitinase Activity
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	*	460	*	480	*	
4M1/1_H2	:	CGCCGCGGGCAGAA	TACTACGGGCGCGGCC	CGCTGCAGATCTCGT	GGA	ACTAC : 495
4M1/11_C10	:	.....				: 474
4M1/26_C2	:	.....C.....C.....				: 486

	500	*	520	*	540	*	
4M1/1_H2	:	AACTACGGGCGCGGG	GAGGGCCATCGGCTTC	GACGGGCTGGG	GAGACCCGGACA	:	550
4M1/11_C10	:	.....C..G.....C.G..				: 529	
4M1/26_C2	:	.....				: 541	

	560	*	580	*	600	
4M1/1_H2	:	GACTGGCGCAGGACCC	CGTGTTGTCGTTCAAG	TCGGCGCTCTGGTTCT	GGATGAA	: 605
4M1/11_C10	:	.GG.....G....G.....G..G.....G.....				: 584
4M1/26_C2	:	.....G.....				: 596

	*	620	*	640	*	660	
4M1/1_H2	:	CAACGTGCACCGTGTG	ATGCCGCAGGGCTTC	GGCGCCACCATCAGG	GCCATCAAC	: 660	
4M1/11_C10	:	.....				: 639
4M1/26_C2	:	.....				: 651

	*	680	*	700	*	
4M1/1_H2	:	GGCGCCCTCGAGTGCG	GGCGGGAACAACCCG	CCCAGATGAACGCGC	CGTCGGCT	: 715
4M1/11_C10	:	.....G.....AA.....				: 694
4M1/26_C2	:	.....AA.....				: 706

	720	*	740	*	760	*	
4M1/1_H2	:	ACTACAGGCAGTACTG	CCGCCAGCTCGGCGTC	GACCCGGGCAACAAC	CTCACCTG	: 770	
4M1/11_C10	:	.....A.....AG.....C.....A..GCC.....				: 749
4M1/26_C2	:	.....				: 761

4M1/1_H2	:	C	:	771
4M1/11_C10	:	.	:	750
4M1/26_C2	:	.	:	762

Figure 7
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4M1/1_H2	:	SMQNCGCQPNVCCSKFGYCGTTDEYCGDGCQSGPCRSGGGGSSGGGGGGGGSSGGA	:	55		
4M1/11_C10	:	.....ASG.....	:	48		
4M1/26_C2	:	.....ASG.....GED...A.....	:	52		

	60	*	80	*	100	*	
4M1/1_H2	:	NVANVVTDAFFNGIKNQAGSWCEGKNFYTRSAFLSAVKAYPGFAHGGSQVQGKRE	:	110			
4M1/11_C10	:	...S...GS.....S....G.....	:	103			
4M1/26_C2	:	.....G.....R...	:	107			

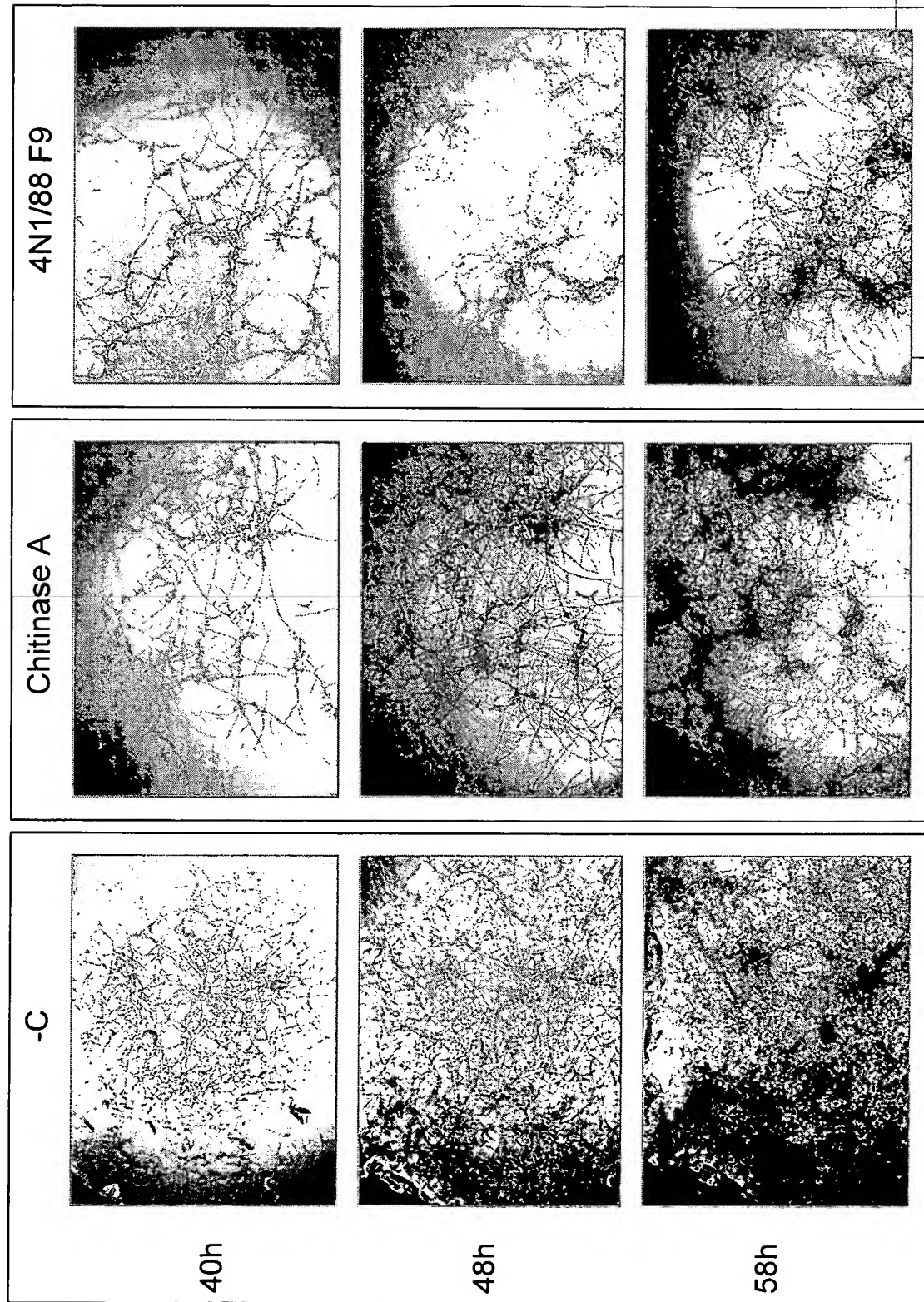
	120	*	140	*	160	
4M1/1_H2	:	IAAFFAHVTHETGHLCYINEVNKSNAYCDPTKRQWPCAAGQKYYGRGPLQISWNY	:	165		
4M1/11_C10	:	.....A.....F...S.....	:	158		
4M1/26_C2	:	.....F...S.....	:	162		

	*	180	*	200	*	220	
4M1/1_H2	:	NYGPAGRAIGFDGLGDPDLAQDPVLSFKSALWFWMNNVHRVMPQGFATIRAIN	:	220			
4M1/11_C10	:	.....G...R.A..A..A.....	:	213			
4M1/26_C2	:	.....A.....	:	217			

	*	240	*	
4M1/1_H2	:	GALECGGNNPAQMNNARVGYYRQYCRQLGVDPGNNLTC	:	257
4M1/11_C10	:N.....Q..R....P....	:	250
4M1/26_C2	:N.....	:	254

Figure 8
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Figure 9
Novel Compositions with Improved Chitinase Activity
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Average of estimated IC50 values

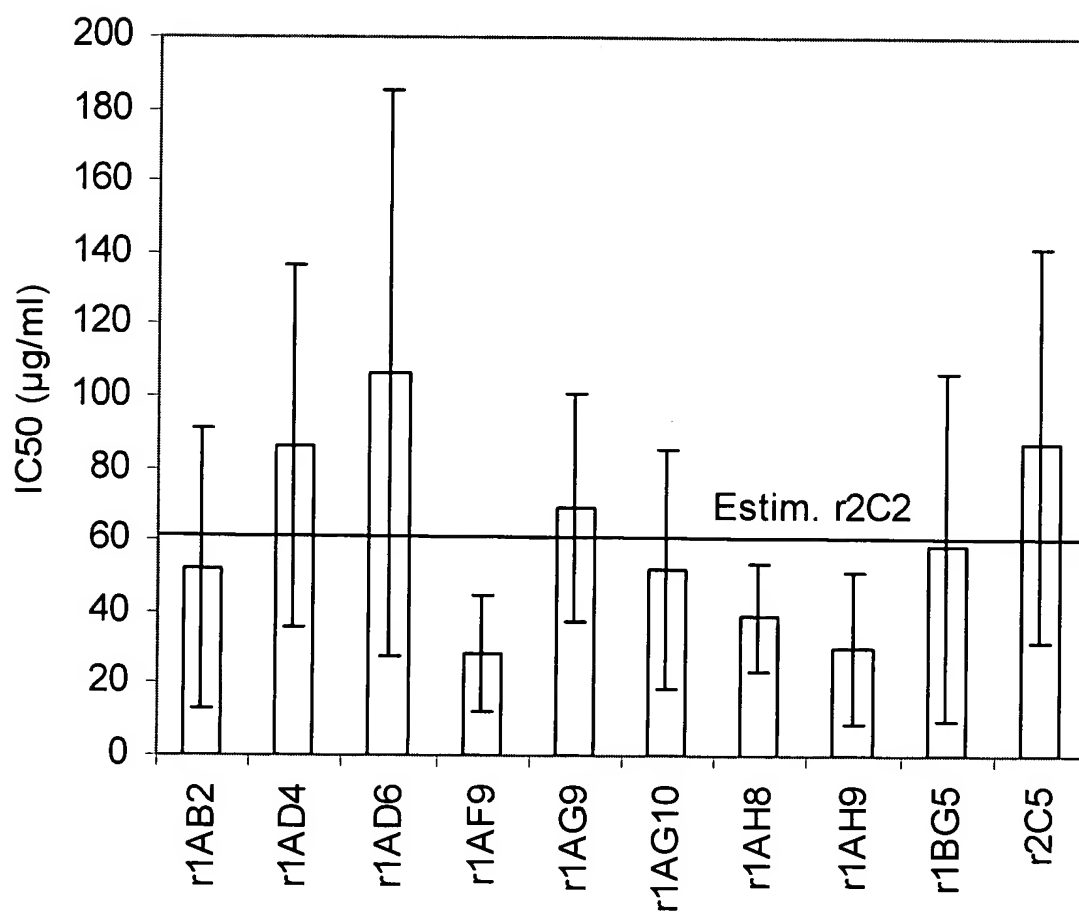


Figure 10
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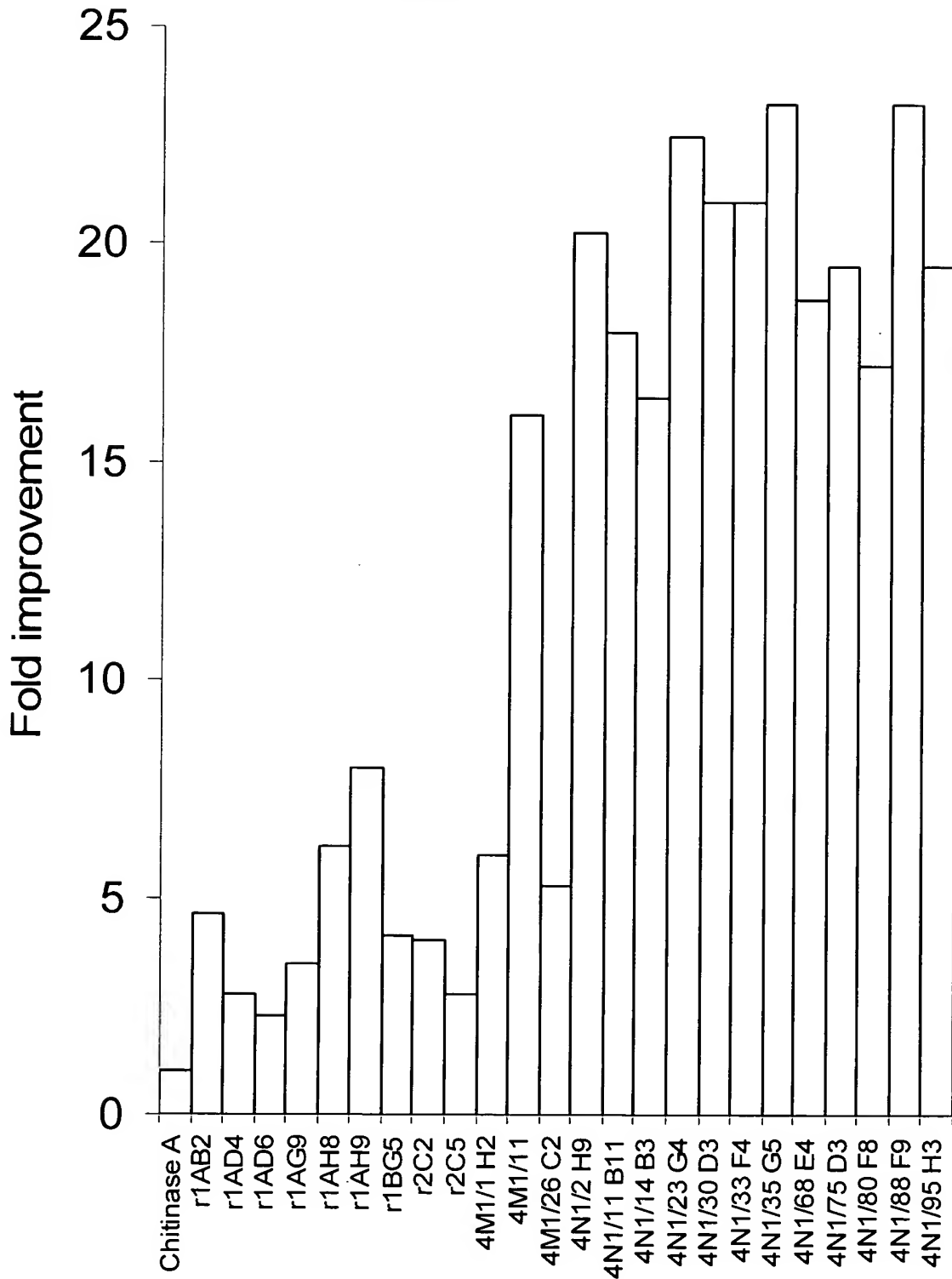


Figure 11a
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	*	20	*	40	*	
r1AB2	:	TCGATGCAGAACTGCGGCTGCCAGCCAACTTCTGCTGCAGCAAGTTCGGCTACT	:			55
r1AD4	:	.....G.A.....T.....	:			55
r1AD6	:	.....T.....	:			55
r1AG9	:	.....G.A.....T.....	:			55
r1AH8	:	.....	:			55
r1AH9	:	.....G.A.....T.....	:			55
r1BG5	:	.....G.A.....	:			55
r2C5	:	.....G...GC.T.GGG.A.G.....CG.....	:			55
4N1/95_H3	:	.....G.A.....T.....	:			55
4N1/80_F8	:	.....G.A.....CG.....	:			55
4N1/75_D3	:	.....G.A.....	:			55
4N1/2_H9	:	.....G.A.....T.....	:			55
4N1/23_G4	:	.....G.A.....T.....	:			55
4N1/68_E4	:	.....G.A.....T.....	:			55
4N1/88_F9	:	.....G.A.....T.....	:			55
4N1/14_B3	:	.....T.....G.A.....	:			55
4N1/33_F4	:	.....T.....	:			55
4N1/11_B11	:	.....G.A.....	:			55
4N1/30_D3	:	.....	:			55
4N1/35_G5	:	.....G.A.....T.....	:			55

	60	*	80	*	100	*	
r1AB2	:	GCGGCACGACCGACGCCTACTGCGGCGACGGGTGCCAGTCGGGCCCCGTGCCGCTC	:				110
r1AD4	:	.....AG.....	:				110
r1AD6	:	.....AG.....C.....	:				110
r1AG9	:	.....A.....AG.....	:				110
r1AH8	:	.....AG.....	:				110
r1AH9	:	.....AG.....C.....	:				110
r1BG5	:	.....AG.....A.....	:				110
r2C5	:	.....AG.....	:				110
4N1/95_H3	:	.....AG.....	:				110
4N1/80_F8	:	.....AG.....G.....	:				110
4N1/75_D3	:	.....AG.....	:				110
4N1/2_H9	:	.....AG.....	:				110
4N1/23_G4	:	.....AG.....	:				110
4N1/68_E4	:	.....AG.....C.....A.....	:				110
4N1/88_F9	:	.....A.....AG.....A.....	:				110
4N1/14_B3	:AG.....C.....	:				110
4N1/33_F4	:	:				110
4N1/11_B11	:AG.....C.....	:				110
4N1/30_D3	:A.....AG.....	:				110
4N1/35_G5	:AG.....C.....	:				110

Figure 11b
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	120	*	140	*	160	
r1AB2	: GGGCGGCGGCGGCAGCAGTGGCGGCGGT		-----			: 138
r1AD4	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 159
r1AD6	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
r1AG9	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 159
r1AH8	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
r1AH9	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 159
r1BG5	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 165
r2C5	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 156
4N1/95_H3	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 141
4N1/80_F8	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 159
4N1/75_D3	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 156
4N1/2_H9	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 141
4N1/23_G4	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
4N1/68_E4	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
4N1/88_F9	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
4N1/14_B3	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 138
4N1/33_F4	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 156
4N1/11_B11	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 156
4N1/30_D3	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGC	: 159
4N1/35_G5	:T...G..G.C.....CGGAGGCGGC		-----		GGAGGCAGTGGT	: 159

	*	180	*	200	*	220	
r1AB2	: GGTGCGAACGTGGCTAGCGTCGTACCGGCTCCTTCTTCAACGGCATCAAGAGCC						: 193
r1AD4	:AT..G.....A.G.G.....A..						: 214
r1AD6	:AT..G.....A.G.G.....A..						: 193
r1AG9	:AT..G.....A.G.G.....A..						: 214
r1AH8	:T.....A.....A.....A..						: 193
r1AH9	:AT..G.....A.G.G.....A..						: 214
r1BG5	:AT..G.....A.....A..						: 220
r2C5	:G.....A..						: 211
4N1/95_H3	: ---.....AT..G.....A.G.G.....A..						: 193
4N1/80_F8	:AT..G.....A.G.G.....A..						: 214
4N1/75_D3	:T.....C...A...G.....A..						: 211
4N1/2_H9	: ---.T.....C...A...G.....A..						: 193
4N1/23_G4	:A.....A..						: 193
4N1/68_E4	:A.....A..						: 193
4N1/88_F9	:A.....A..						: 193
4N1/14_B3	:A.....A..						: 193
4N1/33_F4	:AT..G.....A.G.G.....A..						: 211
4N1/11_B11	:A.....A..						: 211
4N1/30_D3	:AT..G.....A.G.G.....A..						: 214
4N1/35_G5	:A.....A..						: 214

Figure 11c
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	*	240	*	260	*	
r1AB2	:	AGGCCGGGAGCGGGTGCGAGGGCAAGAACTTCTACACCCGGAGCGCGTTCCTGAG	:			248
r1AD4	:	.....		CGA	:	269
r1AD6	:	.....			:	248
r1AG9	:	.....		CGA	:	269
r1AH8	:	.....			:	248
r1AH9	:	.....		A.....	:	269
r1BG5	:	.....			:	275
r2C5	:	.....			:	266
4N1/95_H3	:	.....			:	248
4N1/80_F8	:	.....			:	269
4N1/75_D3	:	.....			:	266
4N1/2_H9	:	.....			:	248
4N1/23_G4	:	.....			:	248
4N1/68_E4	:	.....			:	248
4N1/88_F9	:	.....			:	248
4N1/14_B3	:	.....			:	248
4N1/33_F4	:	.....			:	266
4N1/11_B11	:	.....			:	266
4N1/30_D3	:	.....			:	269
4N1/35_G5	:	.....			:	269

	280	*	300	*	320	*	
r1AB2	:	CGCCGTCAAGGCGTACCCAGGCTTCGCCCATGGCGGCTCCGAGGTCGAGCGCAAG	:				303
r1AD4	:	G...A..GCC.....G.....G.....	:				324
r1AD6	:					303
r1AG9	:	G...A..GCC.....G.....G.....	:				324
r1AH8	:	.....C.....G.....GA.G.....G...G.....	:				303
r1AH9	:		G..GC...GC..G.....	:		324
r1BG5	:		G..AC...GC..G.....	:		330
r2C5	:		GA.G.....G...G.....	:		321
4N1/95_H3	:			:		303
4N1/80_F8	:		G..GC...GC..G.....	:		324
4N1/75_D3	:		G..AC...GC..G.....	:		321
4N1/2_H9	:		GA.G.....G...G.....	:		303
4N1/23_G4	:		G..GC...GC..G.....	:		303
4N1/68_E4	:		G..GC...GC..G.....	:		303
4N1/88_F9	:		G..AC...GC..G.....	:		303
4N1/14_B3	:	.....C.....G.....GA.G.....G.....	:				303
4N1/33_F4	:		G..AC...GC..G.....	:		321
4N1/11_B11	:			:		321
4N1/30_D3	:		G..AC...GC..G.....	:		324
4N1/35_G5	:		G..GC...GC..G.....	:		324

Figure 11d
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	340	*	360	*	380	
r1AB2	: CGCGAGATTGCCGCCTTCTTCGCGCATGTACGCACGAGACCGGGCATTCTGCT					: 358
r1AD4	:C.C.....					: 379
r1AD6	:C.....C.C.....T.....					: 358
r1AG9	:C.C.....					: 379
r1AH8	:C.....C.C.....					: 358
r1AH9	:C.....C.C.....					: 379
r1BG5	:C.....					: 385
r2C5	:C.....C.....CA.....					: 376
4N1/95_H3	:					: 358
4N1/80_F8	:C.....C.C.....					: 379
4N1/75_D3	:C.....C.....					: 376
4N1/2_H9	:C.....T.....					: 358
4N1/23_G4	:C.....					: 358
4N1/68_E4	:C.....T.....					: 358
4N1/88_F9	:C.....					: 358
4N1/14_B3	:C.C.....					: 358
4N1/33_F4	:					: 376
4N1/11_B11	:C.C.....					: 376
4N1/30_D3	:C.....C.C.....					: 379
4N1/35_G5	:C.....					: 379

	*	400	*	420	*	440	
r1AB2	: ACATCAGCGAGATCAACAAGAGCAACGCCTACTGCGACCCGACCAAGAGGCAGTG						: 413
r1AD4	:G.....						: 434
r1AD6	:						: 413
r1AG9	:G.....						: 434
r1AH8	:A.....						: 413
r1AH9	:						: 434
r1BG5	:						: 440
r2C5	:						: 431
4N1/95_H3	:						: 413
4N1/80_F8	:						: 434
4N1/75_D3	:G.....						: 431
4N1/2_H9	:G.....						: 413
4N1/23_G4	:						: 413
4N1/68_E4	:						: 413
4N1/88_F9	:						: 413
4N1/14_B3	:						: 413
4N1/33_F4	:						: 431
4N1/11_B11	:A.....						: 431
4N1/30_D3	:						: 434
4N1/35_G5	:						: 434

Figure 11e
 Novel Compositions with Improved Chitinase Activity
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	*	460	*	480	*	
r1AB2	:	GCCGTGCGCCGCGGGGCAGAAGTACTACGGGCGCGGCCCGCTGCAGATCTCGTGG				: 468
r1AD4	:	.....				: 489
r1AD6	:	.....				: 468
r1AG9	:	.....				: 489
r1AH8	:	.....				: 468
r1AH9	:	.....				: 489
r1BG5	:	.....				: 495
r2C5	:	.....				: 486
4N1/95_H3	:	.....				: 468
4N1/80_F8	:	.....				: 489
4N1/75_D3	:	.....				: 486
4N1/2_H9	:	.....				: 468
4N1/23_G4	:	.....				: 468
4N1/68_E4	:	.....C.G.....				: 468
4N1/88_F9	:	.....				: 468
4N1/14_B3	:	.....				: 468
4N1/33_F4	:	.....				: 486
4N1/11_B11	:	.....				: 486
4N1/30_D3	:	.....C.G.....				: 489
4N1/35_G5	:	.....T.....				: 489

	500	*	520	*	540	*	
r1AB2	:	AACTACAACACTACGGGCCCCGCGGGGAGGGCCATCGGCTTCGACGGGCTCGGGGACC					: 523
r1AD4	:	.....					: 544
r1AD6	:	.....T.....					: 523
r1AG9	:	.....					: 544
r1AH8	:	.....					: 523
r1AH9	:	.....C.....A.....A.....CC.....					: 544
r1BG5	:	.....					: 550
r2C5	:	.....C.....					: 541
4N1/95_H3	:	.....					: 523
4N1/80_F8	:	.....T.....					: 544
4N1/75_D3	:	.....T.....					: 541
4N1/2_H9	:	.....					: 523
4N1/23_G4	:	.....					: 523
4N1/68_E4	:	.....C.....A.....A.....CC.....					: 523
4N1/88_F9	:	.....A.....A.....CC.....					: 523
4N1/14_B3	:G.....					: 523
4N1/33_F4	:					: 541
4N1/11_B11	:CC.....					: 541
4N1/30_D3	:C.....A.....A.....CC.....					: 544
4N1/35_G5	:CC.....					: 544

Figure 11f
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	560	*	580	*	600	
r1AB2	:	CCGGCAGGGTGGCGCGGGACGCCGTGGTGGCGTTCAAGGCGGCGCTCTGGTTCTG	:			578
r1AD4	:	:			599
r1AD6	:	.....A....C....C.....	:			578
r1AG9	:	:			599
r1AH8	:	:			578
r1AH9	:	..AA.....A.....	:			599
r1BG5	:	.....A.....A.C.....T.....A...	:			605
r2C5	:	:			596
4N1/95_H3	:	:			578
4N1/80_F8	:	..AA.....	:			599
4N1/75_D3	:	:			596
4N1/2_H9	:	.....T.....	:			578
4N1/23_G4	:	:			578
4N1/68_E4	:	..AA.....A.....A.C.....T.....	:			578
4N1/88_F9	:	..AA.....A.....	:			578
4N1/14_B3	:	:			578
4N1/33_F4	:	:			596
4N1/11_B11	:	:			596
4N1/30_D3	:	..AA.....C....C.....	:			599
4N1/35_G5	:	..AA.....A.....	:			599

	*	620	*	640	*	660	
r1AB2	:	GATGAACAACGTGCACCGTGTGATGCCGCAGGGCTTCGGCGCCACCATCAGGGCC	:				633
r1AD4	:	.....	:				654
r1AD6	:	.....G.....G.G...G.....	:				633
r1AG9	:	.....	:				654
r1AH8	:	.....	:				633
r1AH9	:	.....G.....G.G...G.....G.....C.....	:				654
r1BG5	:	....G.G...A.....AGC.C....C.....	:				660
r2C5	:	.....G.....G.G.....C....G.....	:				651
4N1/95_H3	:	.....	:				633
4N1/80_F8	:	.....G.....G.G...G.....G.....C.....	:				654
4N1/75_D3	:	.....	:				651
4N1/2_H9	:	.....G.....G.G...GC.....G.....	:				633
4N1/23_G4	:	.....	:				633
4N1/68_E4	:	.....	:				633
4N1/88_F9	:	.....	:				633
4N1/14_B3	:	.....	:			C.....	633
4N1/33_F4	:	.....	:				651
4N1/11_B11	:	.....	:				651
4N1/30_D3	:	.....	:				654
4N1/35_G5	:	:				654

Figure 11g
Novel Compositions with Improved Chitinase Activity
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	*	680	*	700	*	
r1AB2	:	ATCAACGGCGCCCTCGAGTGCGACGGCAAGAACCCCAACTCCGTCAACAACCGCG	:	688		
r1AD4	:	.....G...G...C.....GC.CAGA.G...GCG....	:	709		
r1AD6	:	.....A....G...C.....GC.CAGA.G...GCG....	:	688		
r1AG9	:	.....G...G...C.....GC.CAGA.G...GCG....	:	709		
r1AH8	:	.....A....G...C.....GC.CAGA.G...GCG....	:	688		
r1AH9	:	.....A....G...C.....GC.CAGA.G...GCG....	:	709		
r1BG5	:	.....G...G...C.....GC.CAGA.G...GCG....	:	715		
r2C5	:	.....G.....G...C.....GC.CAGA.G...GCG....	:	706		
4N1/95_H3	:	.....G...G...C.....GC.CAGA.G...GCG....	:	688		
4N1/80_F8	:	.....A....G...C.....GC.CAGA.G...GCG....	:	709		
4N1/75_D3	:	.....G...G...C.....GC.CAGA.G...GCG....	:	706		
4N1/2_H9	:	.....A.....G...G...C.....GC.CAGA.G...GCG....	:	688		
4N1/23_G4	:	.....G...G...C.....GC.CAGA.G...GCG....	:	688		
4N1/68_E4	:	.....G...G...C.....GC.CAGA.G...GCG....	:	688		
4N1/88_F9	:	.....G...G...C.....GC.CAGA.G...GCG...A	:	688		
4N1/14_B3	:	.....G...G...C.....GC.CAGA.G...GCG....	:	688		
4N1/33_F4	:	.....G...C.....GC.CAGA.G...GCG....	:	706		
4N1/11_B11	:	.....G.....G...C.....GC.CAGA.G...GCG....	:	706		
4N1/30_D3	:	.....A.....G...G...C.....GC.CAGA.GG...GCG....	:	709		
4N1/35_G5	:	.....G...G...C.....GC.CAGA.G...GCG....	:	709		

	720	*	740	*	760	*	
r1AB2	:	TCGCCTACTACAAGCAGTTCTGCCAGGATTTTCGGCGTCGACCCAGGGCCCAACCT	:	743			
r1AD4	:	...G.....A.....GCC.GC.....	:	764			
r1AD6	:	...G.....A.....GCC.GC.....	:	743			
r1AG9	:	...G.....A.....GCC.GC.....	:	764			
r1AH8	:	...G.....A.....C.GC...C.....	:	743			
r1AH9	:	...G.....G.....A.....GCC.GC.....	:	764			
r1BG5	:	...G.....A.....CC.GC.....	:	770			
r2C5	:	...G.....A.....C.GC...C.....G...CAA.....	:	761			
4N1/95_H3	:	...G.....A.....GCC.GC.....	:	743			
4N1/80_F8	:	...G.....A.....GCC.GC.....	:	764			
4N1/75_D3	:	...G.....G.....A.....GCC.GC.....	:	761			
4N1/2_H9	:	...G.....A.....CC.GC.....	:	743			
4N1/23_G4	:	...G.....G.....A.....GCC.GC.....	:	743			
4N1/68_E4	:	...G.....G.....A.....GCC.GC.....	:	743			
4N1/88_F9	:	...G.....A.....GCC.GC.....	:	743			
4N1/14_B3	:	...G.....A.....GCC.GC.....	:	743			
4N1/33_F4	:	...G.....G.....A.....GCC.GC.....	:	761			
4N1/11_B11	:	...G.....A.....GCC.GC.....	:	761			
4N1/30_D3	:	...G.....A.....GCC.GC.....	:	764			
4N1/35_G5	:	...G.....A.....GCC.GC.....	:	764			

Figure 11h
Novel Compositions with Improved Chitinase Activity
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r1AB2	:	TACTTGC	:	750
r1AD4	:	C.....	:	771
r1AD6	:	C.....	:	750
r1AG9	:	C.....	:	771
r1AH8	:	C.....	:	750
r1AH9	:	C.....	:	771
r1BG5	:	C.....	:	777
r2C5	:	C.....	:	768
4N1/95_H3	:	C.....	:	750
4N1/80_F8	:	C.....	:	771
4N1/75_D3	:	C.....	:	768
4N1/2_H9	:	C.....	:	750
4N1/23_G4	:	C.....	:	750
4N1/68_E4	:	C.....	:	750
4N1/88_F9	:	C.....	:	750
4N1/14_B3	:	C.....	:	750
4N1/33_F4	:	C.....	:	768
4N1/11_B11	:	C.....	:	768
4N1/30_D3	:	C.....	:	771
4N1/35_G5	:	C.....	:	771

Figure 12a
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
r1AB2	:	SMQNCGCQPNFCCSKFGYCGTTDAYCGDGCQSGPCRSGGGGSSGGG	:	-----	:	46
r1AD4	:V.....E.....GG...GGG--GGSG	:		:	53
r1AD6	:	.....E...A.....	:	-----	:	46
r1AG9	:	.....V.....E.....GG...GGG--GGSG	:		:	53
r1AH8	:	.....E.....	:	-----	:	46
r1AH9	:	.....V.....E.....P...GG...GGG--GGSG	:		:	53
r1BG5	:	.....V.....E.....H.....C...GGGSGGGSG	:		:	55
r2C5	:	.....ASGM.....E.....GG...GG--GGSG	:		:	52
4N1/95_H3	:	.....V.....E.....G-----	:		:	47
4N1/80_F8	:	.....V.....E.....R.....GG...GGG--GGSG	:		:	53
4N1/75_D3	:	.....V.....E.....GG...GG--GGSG	:		:	52
4N1/2_H9	:	.....V.....E.....G-----	:		:	47
4N1/23_G4	:	.....V.....E.....	:	-----	:	46
4N1/68_E4	:	.....V.....E...A.....H.....	:	-----	:	46
4N1/88_F9	:	.....V.....E.....H.....GG...-----	:		:	46
4N1/14_B3	:	.....V.....E...A.....	:	-----	:	46
4N1/33_F4	:	.....GG...GG--GGSG	:		:	52
4N1/11_B11	:	.....V.....E.....P...GG...GG--GGSG	:		:	52
4N1/30_D3	:	.....E.....GG...GGG--GGSG	:		:	53
4N1/35_G5	:	.....V.....E.....P...GG...GGG--GGSG	:		:	53

	60	*	80	*	100	*	
r1AB2	:	GANVASVVTGSFFNGIKSQAGSGCEGKNFYTRSAFLSAVKAYPGFAHGGSEVERK	:		:		101
r1AD4	:	....N...DA....N.....E...A.....	:		:		108
r1AD6	:	.....N.....	:		:		101
r1AG9	:	....N...DA....N.....E...A.....	:		:		108
r1AH8	:	.V.....D.....N.....G...	:		:		101
r1AH9	:	....N...DA....N.....R.....G...	:		:		108
r1BG5	:	....N.....N.....G...	:		:		110
r2C5	:	.....S...N.....G...	:		:		107
4N1/95_H3	:	-....N...DA....N.....	:		:		101
4N1/80_F8	:	....N...DA....N.....G...	:		:		108
4N1/75_D3	:	.....N.....G...	:		:		107
4N1/2_H9	:	-V.....N.....G...	:		:		101
4N1/23_G4	:	.....G...	:		:		101
4N1/68_E4	:	.....N.....G...	:		:		101
4N1/88_F9	:	.....N.....G...	:		:		101
4N1/14_B3	:	.....N.....N.....	:		:		101
4N1/33_F4	:N...DA....N.....G...	:		:		107
4N1/11_B11	:G...	:		:		107
4N1/30_D3	:N...DA....N.....G...	:		:		108
4N1/35_G5	:D.....N.....G...	:		:		108

Figure 12b
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	120	*	140	*	160	
r1AB2	:	REIAAFFAHVTHETGHFCYISEINKSNAYCDPTKRQWPCAAGQKYYGRGPLQISW	:			156
r1AD4	:	.....A.....	:			163
r1AD6	:	.....A.....	:			156
r1AG9	:	.....A.....	:			163
r1AH8	:	.....A.....N.....	:			156
r1AH9	:	.....A.....	:			163
r1BG5	:	:			165
r2C5	:	.....L.....	:			162
4N1/95_H3	:	:			156
4N1/80_F8	:	.....A.....	:			163
4N1/75_D3	:	.....R.....	:			162
4N1/2_H9	:	.....S.....	:			156
4N1/23_G4	:	:			156
4N1/68_E4	:	:			156
4N1/88_F9	:	:			156
4N1/14_B3	:	.....A.....	:			156
4N1/33_F4	:	:			162
4N1/11_B11	:	.....A.....N.....	:			162
4N1/30_D3	:	.....A.....	:			163
4N1/35_G5	:	:			163

	*	180	*	200	*	220	
r1AB2	:	NYNYGPAGRAIGFDGLGDPGRVARDAVVAFKAALWFWMNNVHRVMPQGFGATIRA	:				211
r1AD4	:	.....	:				218
r1AD6	:	.....Q.P.....S..G.....	:				211
r1AG9	:	.....	:				218
r1AH8	:	.....	:				211
r1AH9	:	.....D.....A..N...Q.....S..G.....T..	:				218
r1BG5	:	.....Q.....S.....E...Q.....	:				220
r2C5	:	.....L.....S..G.....	:				217
4N1/95_H3	:	.....	:				211
4N1/80_F8	:	.....N.....S..G.....T..	:				218
4N1/75_D3	:	.....	:				217
4N1/2_H9	:	.....S..G.A.....	:				211
4N1/23_G4	:	.....	:				211
4N1/68_E4	:	.....D.....A..N...Q.....S.....	:				211
4N1/88_F9	:	.....D.....A..N...Q.....	:				211
4N1/14_B3	:	.....G.....	:				211
4N1/33_F4	:	.....	:				217
4N1/11_B11	:	.....A.....	:				217
4N1/30_D3	:	.....D.....A..N....P.....	:				218
4N1/35_G5	:A..N...Q.....	:				218

Figure 12c
Novel Compositions with Improved Chitinase Activity
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	*	240	*	
r1AB2	:	INGALECDGKNPNSVNNRVAYYKQFCQDFGVDPGPNLTC	:	250
r1AD4	:G.N..AQ..A..G.....RQL.....	:	257
r1AD6	:	.....N..AQ..A..G.....	:	250
r1AG9	:	.....G.N..AQ..A..G.....RQL.....	:	257
r1AH8	:	.....N..AQ..A..G.....QLR.....	:	250
r1AH9	:	.....N..AQ..A..G.....RQL.....	:	257
r1BG5	:	.....G.N..AQ..A..G.....HQL.....	:	259
r2C5	:	.....N..AQ..A..G.....QLR....N....	:	256
4N1/95_H3	:	.....G.N..AQ..A..G.....RQL.....	:	250
4N1/80_F8	:	.....N..AQ..A..G.....RQL.....	:	257
4N1/75_D3	:	.....G.N..AQ..A..G.....RQL.....	:	256
4N1/2_H9	:	.....G.N..AQ..A..G.....HQL.....	:	250
4N1/23_G4	:	.....G.N..AQ..A..G.....RQL.....	:	250
4N1/68_E4	:	.....G.N..AQ..A..G.....RQL.....	:	250
4N1/88_F9	:	.....G.N..AQ..A..G.....RQL.....	:	250
4N1/14_B3	:	.....RQL.....	:	250
4N1/33_F4	:	.....N..AQ..A..G.....RQL.....	:	256
4N1/11_B11	:	.....N..AQ..A..G.....RQL.....	:	256
4N1/30_D3	:K.G.N..AQ..A..G.....RQL.....	:	257
4N1/35_G5	:G.N..AQ..A..G.....RQL.....	:	257

Round 4 - Estimated IC₅₀ values

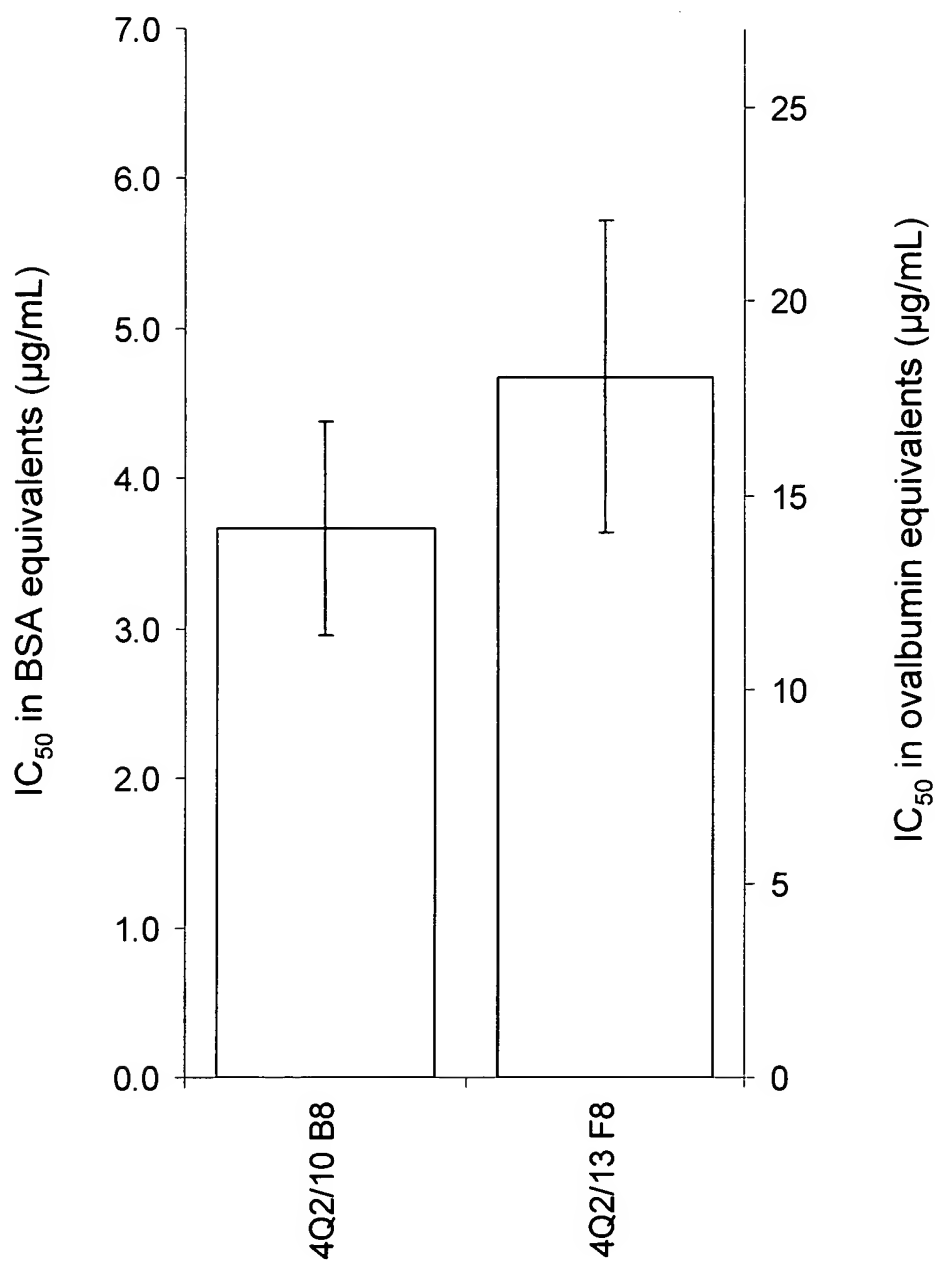


Figure 14
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Round 4 - Estimated IC50 values

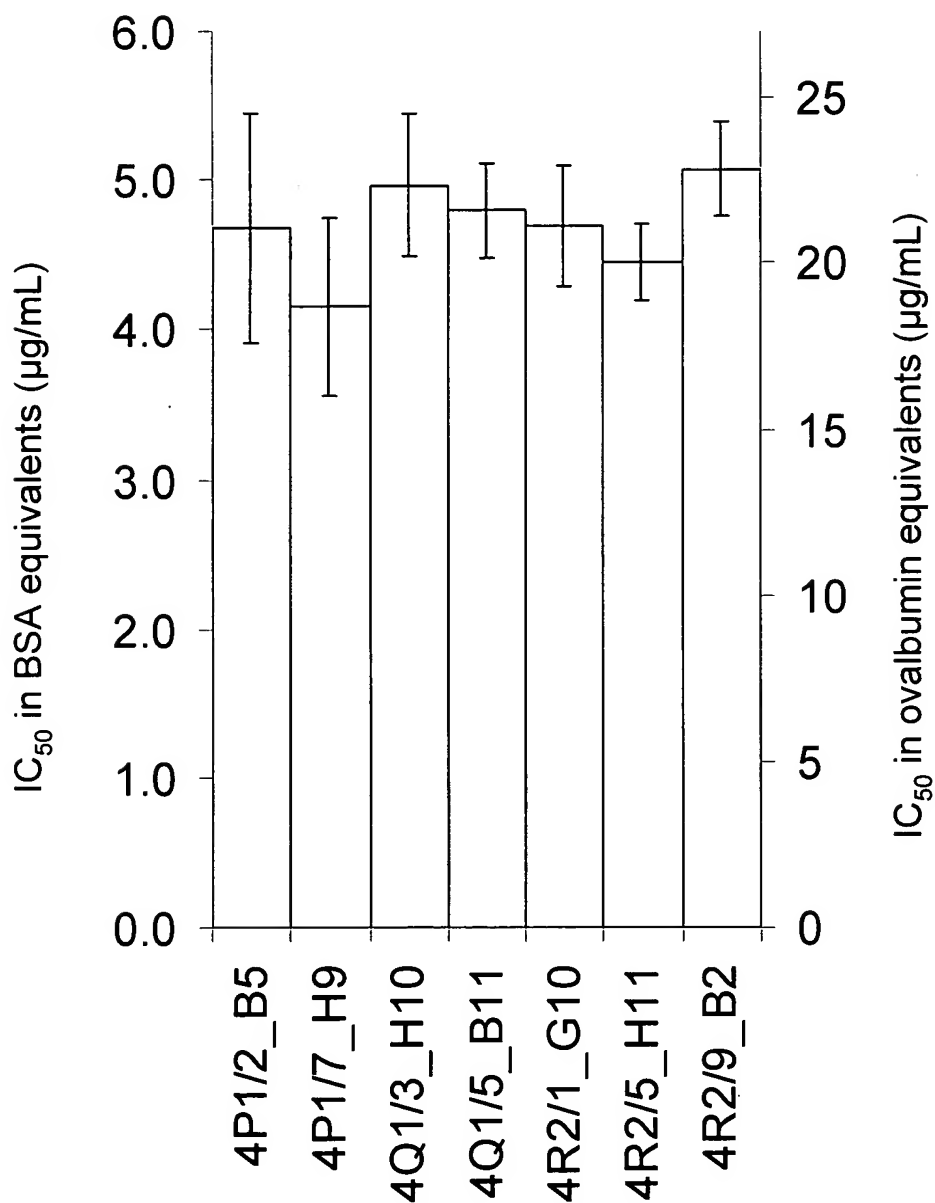


Figure 15
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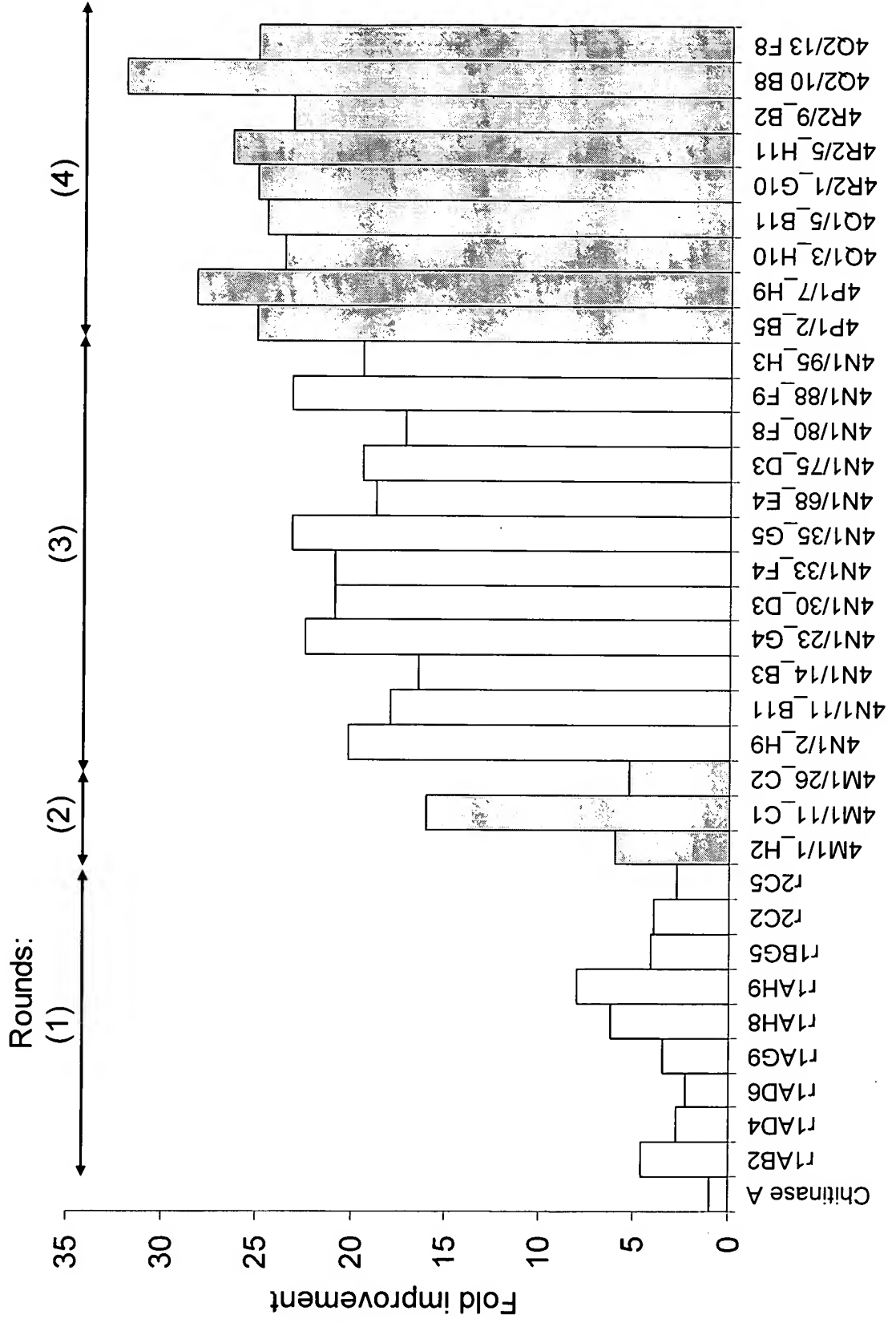


Figure 16a
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4Q2/10_B8 :	TCGATGCAGAACTGCGGCTGCCAGCCAAACGTATGCTGCAGCAAGTTTGGCTACT	:	55			
4Q2/13_F8 :	.....C.....	:	55		
	60	*	80	*	100	*
4Q2/10_B8 :	GCGGCACAACCGACGAGTACTGCGGCGACGGGTGCCAGTCGGGCCCCGTGCCGCCC	:	110			
4Q2/13_F8 :	.....G.....A.T.	:	110		
	120	*	140	*	160	
4Q2/10_B8 :	GGGTGGCGGTGGCGGCGGCGGCGGCGGAGGCGGCGGAGGCAGTGGCGGCGGT	:	165			
4Q2/13_F8 :	..-----A.-----	:	138			
	*	180	*	200	*	220
4Q2/10_B8 :	GGTGTGAACGTGGCCAGCATCGTGACCGGCTCCTTCTTCAACGGCATCAAGAACC	:	220			
4Q2/13_F8 :	.....	:	193		
	*	240	*	260	*	
4Q2/10_B8 :	AGGCCGGGAGCGGGTGCAGGGCAAGAACTTCTACACCGGAGCGCGTTCCTGAG	:	275			
4Q2/13_F8 :	.....	:	248		
	280	*	300	*	320	*
4Q2/10_B8 :	CGCCGTCAAGGCGTACCCAGGCTTCGCCCATGGCGGGTCACAGGTGCAGGGCAAG	:	330			
4Q2/13_F8 :	.....A.GG.....G.....	:	303		
	340	*	360	*	380	
4Q2/10_B8 :	CGCGAGATCGCCGCCTTCTTCGCGCATGTACGCATGAGACCGGGCATTCTCTGCT	:	385			
4Q2/13_F8 :	.....T.....C.C.....C.....	:	358		
	*	400	*	420	*	440
4Q2/10_B8 :	ACATCAGCGAGATCAGCAAGAGCAACGCCTACTGCGACCCGACCAAGAGGCAGTG	:	440			
4Q2/13_F8 :	.....	:	413		
	*	460	*	480	*	
4Q2/10_B8 :	GCCGTGCGCCGCGGGGCGAAGTACTACGGGCGCGGCCCGCTGCAGATCTCGTGG	:	495			
4Q2/13_F8 :	.....A.....	:	468		
	500	*	520	*	540	*
4Q2/10_B8 :	AACTACAACCTACGGGCCCCGCGGGGAGGGCCATCGGCTTCGACGGGCTCGGGGACC	:	550			
4Q2/13_F8 :	:	523			

Figure 16b
 Novel Compositions with Improved Chitinase Activity
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	560	*	580	*	600	
4Q2/10_B8	:	CCAACAGGGTGGCGCGGGACCCCGTGCTGGCGTTCAAGGCGGCGCTCTGGTTCTG	:	605		
4Q2/13_F8	:	.....G.....G.....	:	578		
	*	620	*	640	*	660
4Q2/10_B8	:	GATGAACAGCGTGACAGGGGTGGTGCCGCAGGGGTTTCGGCGCCACCACCAGGGCC	:	660		
4Q2/13_F8	:	.....C.T...A.....C.....T.....	:	633		
	*	680	*	700	*	
4Q2/10_B8	:	ATCAACGGCGCCCTCGAGTGCAACGGGAACAACCCCGCCAGATGAACGCGCGCG	:	715		
4Q2/13_F8	:	.....GG.....A	:	688		
	720	*	740	*	760	*
4Q2/10_B8	:	TCGGCTACTACAGGCAGTACTGCCGCCAGCTCGGCGTCGACCCAGGGCCCAACCT	:	770		
4Q2/13_F8	:	.....A.....	:	743		
	780	*	800	*		
4Q2/10_B8	:	CACTTGCTCTAGAGGTGGAAGTCATCATCATCATCATCATCATCATTGA	:	819		
4Q2/13_F8	:	:	792		

Figure 17
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4Q2/10_B8 :	SMQNCGCQPNVCCSKFGYCGTTDEYCGDGCQSGPCRPGGGGGGGGGGGGGSGGG	:		:		55
4Q2/13_F8 :	.....HS-----S-----	:		:		46
	60	*	80	*	100	*
4Q2/10_B8 :	GVNVASIVTGSFFNGIKNQAGSGCEGKNFYTRSAFLSAVKAYPGFAHGGSQVQGK	:		:		110
4Q2/13_F8 :	.....TE.E..	:		:		101
	120	*	140	*	160	
4Q2/10_B8 :	REIAAFFAHVTHETGHFCYISEISKSNAYCDPTKRQWPCAAGQKYYGRGPLQISW	:		:		165
4Q2/13_F8 :	.....A.....	:		:		156
	*	180	*	200	*	220
4Q2/10_B8 :	NYNYGPAGRAIGFDGLGDPNRRVARDPVLAFKAALWFMNSVHGVVPQGFGATTR	:		:		220
4Q2/13_F8 :	.....A.V.....R.M.....I..	:		:		211
	*	240	*	260	*	
4Q2/10_B8 :	INGALECNGNNPAQMNRVGYRQYCRQLGVDPGNLTCSRGGSHHHHHHHH-	:		:		272
4Q2/13_F8 :G.....I...K.....-	:		:		263

Figure 18a
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4P1/2_B5	:	TCGATGCAGAACTGCGGCTGCCAGCCAAACGTATGCTGCAGCAAGTTCGGCTACT	:	55		
4P1/7_H9	:	.....	:	55		
4Q1/3_H10	:	.....	:	55		
4R2/5_H11	:	.....T.....	:	55		
4R2/1_G10	:	.....T.....	:	55		
4Q1/5_B11	:	.....	:	55		
4R2/9_B2	:	.....	:	55		

	60	*	80	*	100	*	
4P1/2_B5	:	GCGGCACAACCGACGAGTACTGCGGCGACGGGTGCCAGTCGGGCCCCGTGCCGCTC	:	110			
4P1/7_H9	:	:	110			
4Q1/3_H10	:	.....G.....	:	110			
4R2/5_H11	:	.....G.....A...	:	110			
4R2/1_G10	:	.....G.....C.....A...	:	110			
4Q1/5_B11	:	.....G.....C.....	:	110			
4R2/9_B2	:	.....G.....C.....	:	110			

	120	*	140	*	160	
4P1/2_B5	:	GGGCGGCGGCGGCGGCGGAGGCGG-----CGGAGGCAGTGGTGCG	:	156		
4P1/7_H9	:	.....A..A.T..C.....	:	144		
4Q1/3_H10	:	.....T.....C.....CGGAGGCGG.....C.....	:	165		
4R2/5_H11	:	.....A..A.T..C.....TGG-----	:	144		
4R2/1_G10	:	.....A.....C.....	:	141		
4Q1/5_B11	:	.....T.....C.....AGGCGG---.....C.....	:	162		
4R2/9_B2	:	.....T.....C.....AGGCGG---.....	:	162		

	*	180	*	200	*	220	
4P1/2_B5	:	AACGTGGCTAGCGTCGTCACCGGCTCCTTCTTCAACGGCATCAAGAACCAGGCCG	:	211			
4P1/7_H9	:	.....	:	199			
4Q1/3_H10	:	.....AT..G.....A.G.G.....G.....	:	220			
4R2/5_H11	:	..T.....AT..G.....A.G.G.....	:	199			
4R2/1_G10	:	.....A.....G.....	:	196			
4Q1/5_B11	:	.....A.....G.....	:	217			
4R2/9_B2	:	.....G.....	:	217			

	*	240	*	260	*	
4P1/2_B5	:	GGAGCGGGTGCAGGGCAAGAACTTCTACACCGGAGCGCGTTCTTGAGCGCCGT	:	266		
4P1/7_H9	:	.....	:	254		
4Q1/3_H10	:	.....	:	275		
4R2/5_H11	:	.....	:	254		
4R2/1_G10	:	.....	:	251		
4Q1/5_B11	:	.....	:	272		
4R2/9_B2	:	:	272		

Figure 18b
 Novel Compositions with Improved Chitinase Activity
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	280	*	300	*	320	*	
4P1/2_B5	:	CAAGGCGTACCCAGGCTTCGCCCATGGCGGGTCACAGGTGCAGGGCAAGCGCGAG	:	321			
4P1/7_H9	:	:	309			
4Q1/3_H10	:	:	330			
4R2/5_H11	:	.....G.....	:	309		
4R2/1_G10	:	.....G.....	:	306		
4Q1/5_B11	:	.....G.....	:	327		
4R2/9_B2	:	.....G.....	:	327		

	340	*	360	*	380	
4P1/2_B5	:	ATTGCCGCCTTCTTCGCGCACGCCACGCACGAGACCGGGCATTCTGTCTACATCA	:	376		
4P1/7_H9	:	..C.....T.....	:	364		
4Q1/3_H10	:	..C.....	:	385		
4R2/5_H11	:	.....T.....	:	364	
4R2/1_G10	:	..C.....T.T.....	:	361		
4Q1/5_B11	:	..C.....T.T.....	:	382		
4R2/9_B2	:	..C.....T.T.....	:	382		

	*	400	*	420	*	440	
4P1/2_B5	:	GCGAGATCAACAAGAGCAACGCCTACTGCGACCCGACCAAGAGGCAGTGGCCGTG	:	431			
4P1/7_H9	:	.....G.....	:	419		
4Q1/3_H10	:	.....	:	440		
4R2/5_H11	:	.....	:	419		
4R2/1_G10	:	.....	:	416		
4Q1/5_B11	:	A.....	:	437			
4R2/9_B2	:	.....	:	437		

	*	460	*	480	*	
4P1/2_B5	:	CGCCGCGGGGCAGAAGTACTACGGGCGCGGCCCCGCTGCAGATCTCGTGGAACCTAC	:	486		
4P1/7_H9	:	.....	:	474	
4Q1/3_H10	:	.....	:	495	
4R2/5_H11	:	.....	:	474	
4R2/1_G10	:	.....	:	471	
4Q1/5_B11	:	.....G.....T.....	:	492	
4R2/9_B2	:	.....T.....	:	492	

	500	*	520	*	540	*	
4P1/2_B5	:	AACTACGGGCCCCGCGGGGAGGGCCATCGGCTTCGACGGGCTCGGGGACCCCAACA	:	541			
4P1/7_H9	:	.....A.....GG..	:	529		
4Q1/3_H10	:	.....GG..	:	550		
4R2/5_H11	:	.....GG..	:	529		
4R2/1_G10	:	.....CC.....	:	526		
4Q1/5_B11	:	.....GG..	:	547		
4R2/9_B2	:T.....CC.....	:	547			

Figure 18c
Novel Compositions with Improved Chitinase Activity
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	560	*	580	*	600	
4P1/2_B5	:	GGGTGGCGCAGGACGCCGTGGTGGCGTTCAAGGCGGCGCTCTGGTTCTGGATGAA	:	596		
4P1/7_H9	:	.....G.....	:	584	
4Q1/3_H10	:	.....G.....	:	605	
4R2/5_H11	:	.....G.....	:	584	
4R2/1_G10	:		:	581		
4Q1/5_B11	:	.....G.....	:	602	
4R2/9_B2	:		:	602		

	*	620	*	640	*	660	
4P1/2_B5	:	CAACGTGCACCGTGTGATGCCGCAGGGCTTCGGCGCCACCATCAGGGCCATCAAC	:	651			
4P1/7_H9	:		:	639			
4Q1/3_H10	:		:	660			
4R2/5_H11	:	.....G.....T.....C.....	:	639		
4R2/1_G10	:		:	636			
4Q1/5_B11	:		:	657			
4R2/9_B2	:		:	657			

	*	680	*	700	*	
4P1/2_B5	:	GGCGCGCTCGAGTGCACGGAACAACCCCGCCCAGATGAACGCGCGCTCGGCT	:	706		
4P1/7_H9	:		:	694		
4Q1/3_H10	:		:	715		
4R2/5_H11	:	.....C.....G.....A.....	:	694	
4R2/1_G10	:		:	691		
4Q1/5_B11	:	.....C.....A.....	:	712	
4R2/9_B2	:	.....C.....G.....	:	712	

	720	*	740	*	760	*	
4P1/2_B5	:	ACTACAAGCAGTACTGCCGCCAGCTCGGCGTCGACCCAGGGCCCAACCTCACTTG	:	761			
4P1/7_H9	:		:	749			
4Q1/3_H10	:		:	770			
4R2/5_H11	:		:	749			
4R2/1_G10	:		:	746			
4Q1/5_B11	:		:	767			
4R2/9_B2	:	.....G.....	:	767		

	780	*	800	*	
4P1/2_B5	:	CTCTAGAGGTGGAAGTCATCATCATCATCATCATCATTGA	:	804	
4P1/7_H9	:		:	792	
4Q1/3_H10	:		:	813	
4R2/5_H11	:		:	792	
4R2/1_G10	:		:	789	
4Q1/5_B11	:		:	810	
4R2/9_B2	:		:	810	

Figure 19
 Novel Compositions with Improved Chitinase Activity
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	*	20	*	40	*	
4P1/2_B5	:	SMQNCGCQPNVCCSKFGYCGTTDEYCGDGCQSGGPCRS		GGGGGGGGGGGG	---	SGGA : 52
4R2/1_G10	:	.....A.....H.....S.....				----- : 47
4R2/9_B2	:	.....P.....				GG-.... : 54
4P1/7_H9	:	.....SS.....				----- : 48
4R2/5_H11	:	.....H.....SS.....				----- : 48
4Q1/3_H10	:	.....GGG.....				: 55
4Q1/5_B11	:	.....P.....				GG-.... : 54

	60	*	80	*	100	*	
4P1/2_B5	:	NVASVVTGSFFNGIKNQAGSGCEGKNFYTRSAFLSAVKAYPGFAH		GGSQVQGKRE	:		107
4R2/1_G10	:	.....D.....S.....					: 102
4R2/9_B2	:	.....S.....					: 109
4P1/7_H9	:					: 103
4R2/5_H11	:	...N...DA.....					: 103
4Q1/3_H10	:	...N...DA.....S.....					: 110
4Q1/5_B11	:	.....D.....S.....					: 109

	120	*	140	*	160	
4P1/2_B5	:	IAAFFAHATHETGHFCYISEINKSNAYCDPTKRQWPCAAGQKYYGRGPLQISWNY		:		162
4R2/1_G10	:	.....V.....				: 157
4R2/9_B2	:	.....V.....				: 164
4P1/7_H9	:	.....S.....				: 158
4R2/5_H11	:				: 158
4Q1/3_H10	:				: 165
4Q1/5_B11	:	.....V.....N.....				: 164

	*	180	*	200	*	220	
4P1/2_B5	:	NYGPAGRAIGFDGLGDPNRVAQDAVVAFKAAALWFWMNNVHRVMPQGFGATIRAIN		:			217
4R2/1_G10	:	.....A.....				: 212
4R2/9_B2	:	.....A.....				: 219
4P1/7_H9	:	.....D.....G...R.....				: 213
4R2/5_H11	:	.....G...R.....				: 213
4Q1/3_H10	:	.....G...R.....				: 220
4Q1/5_B11	:	.....G...R.....				: 219

	*	240	*	260	*	
4P1/2_B5	:	GALECDGNNPAQMNARVGYYKQYCRQLGVDPGPNLTCSRGGSHHHHHHHH-		:		267
4R2/1_G10	:	.....				: 262
4R2/9_B2	:	.....G.....				: 269
4P1/7_H9	:	.....				: 263
4R2/5_H11	:	.....G.....				: 263
4Q1/3_H10	:	.....				: 270
4Q1/5_B11	:	.....				: 269